REMARKS

This is intended as a full and complete response to the Office Action dated February 5, 2003, having a shortened statutory period for response set to expire on May 5, 2003. Please reconsider the claims pending in the application for reasons discussed below.

Claims 1-22 are pending in the application and are subject to restriction and/or election requirement. Claims 16-22 are withdrawn from consideration. Applicants have canceled claims 16-22. Applicants have added new claims 23-29 to claim additional features of the invention. Applicants submit that the changes made herein do not introduce new matter and are supported by the specification.

Claims 1-3 and 6-15 stand rejected. Claims 4 and 5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 6, 7, and 9-13 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. § 112, second paragraph, and to include all of the limitations of the base claim and any intervening claims.

Claims 8 and 10 stand objected to because of informalities. Applicants have amended claim 8 to correct the spelling of "tetraethyl," as requested by the Examiner. Applicants have amended claim 10 to replace the symbol "ºC" with "°C." Applicants submit that the changes made herein do not introduce new matter and are supported by the specification. Applicants respectfully request withdrawal of the objection to claims 8 and 10.

Claims 6, 7, and 9-13 stand rejected under 35 U.S.C. § 112, second paragraph. Applicants have amended claim 6 by changing "carrier gases" to "carrier gas in the process mixture," which has proper antecedent basis in claim 2. Applicants submit that the changes made herein do not introduce new matter and are supported by the specification. Applicants respectfully request withdrawal of the rejection of claims 6, 7, and 9-13.

Claims 1-3, 8, 14, and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Rose, et al.* (U.S. Patent No. 6,068,884) in view of *Van De Ven, et al.* (U.S. Patent No. 5,882,417). Applicants have amended claim 1 to specify that the

deposited film has a different composition at the edge of the substrate that at the center of the substrate. Applicants submit that the changes made herein do not introduce new matter and are supported by the specification.

The Examiner asserts that *Van De Ven, et al.* describes delivering a deposition control gas comprising either inert gases or a mixture of inert gases and reactive component gases to the edge of a substrate to control deposition uniformity at the edge of the substrate. Applicants agree that *Van De Ven, et al.* describes exposing the edge of a substrate to a deposition control gas that enhances the deposition at the edge of the substrate. *Van De Ven, et al.* teaches depositing a tungsten film on a substrate by a process that includes exposing the edge of the substrate to a deposition control gas that includes hydrogen and argon. *Van De Ven, et al.* teaches that the hydrogen in the deposition control gas enhances the deposition of tungsten at the edge of the substrate (column 11, lines 30-58). However, *Van De Ven, et al.* does not describe or suggest depositing a film that has a different composition at the edge of the substrate than at the center of the substrate. *Van De Ven, et al.* only suggests depositing a uniform tungsten film on a substrate. Furthermore, *Rose, et al.* does not describe, suggest, or motivate depositing a film that has a different composition at the edge of the substrate than at the center of the substrate. Thus, *Van De Ven, et al.* and *Rose, et al.*, alone or in combination, do not teach, show, or suggest a method for depositing a film on a substrate, comprising positioning a substrate in a chamber on a substrate support, flowing a carrier gas into the chamber, flowing a process gas mixture adjacent an edge of the substrate through a purge gas inlet in the substrate support, generating a plasma, delivering a first carbon silicon gas source to the chamber through another gas inlet, and depositing a film on the substrate, wherein the film has a different composition at the edge of the substrate than at the center of the substrate, as recited in claim 1. Applicants respectfully request withdrawal of the rejection of claim 1 and of claims 2-3, 8, 14, 15, and 21, which depend thereon, and of the objection to claims 4-7 and 9-13.

Applicants submit that new claim 24 is patentable for the reasons discussed above with respect to claim 1. Claim 24 recites a method of depositing a film on a substrate, wherein the film has a higher concentration of silicon oxide at the edge of the substrate than at the center of the substrate. As discussed above, *Van De Ven, et al.*

and *Rose, et al.*, alone or in combination, do not describe or motivate a method for depositing a film that has a different composition at the edge of the substrate than at the center of the substrate. Thus, *Van De Ven, et al.* and *Rose, et al.*, alone or in combination, do not teach, show, or suggest a method for depositing a film on a substrate, comprising positioning a substrate in a chamber on a substrate support, flowing a carrier gas into the chamber, flowing a process gas mixture comprising an oxygen source adjacent an edge of the substrate through a purge gas inlet in the substrate support, generating a plasma, delivering a first carbon silicon gas source to the chamber through another gas inlet, and depositing a film on the substrate, wherein the film has a higher concentration of silicon oxide at the edge of the substrate than at the center of the substrate, as recited in claim 24. Applicants respectfully request allowance of claims 24-27.

Applicants submit that *Van De Ven, et al.* and *Rose, et al.*, alone or in combination, do not teach, show, or suggest a method for depositing a film on a substrate, comprising positioning a substrate in a chamber on a substrate support, flowing a carrier gas into the chamber, flowing a process gas mixture comprising an oxygen source adjacent an edge of the substrate through a purge gas inlet in the substrate support, generating a plasma, delivering a first carbon silicon gas source consisting of carbon, silicon, and hydrogen to the chamber through another gas inlet, and depositing a film comprising oxygen on the substrate, as recited in claim 28. *Van De Ven, et al.* describes introducing a deposition control gas near the edge of a substrate and defines a deposition control gas as a gas that assists in controlling or eliminating chemical vapor deposition of material on certain portions of the substrate (column 7, lines 16-31). *Van De Ven, et al.* further describes using a deposition control gas that includes hydrogen, which enhances the deposition of tungsten on the substrate. However, *Van De Ven, et al.* does not describe using a deposition control gas that includes material that is deposited as part of the tungsten film on the substrate. Instant claim 28 describes a method wherein one gas mixture comprising an oxygen source is introduced into the chamber adjacent an edge of the substrate through a purge gas inlet and another gas mixture consisting of carbon, silicon, and hydrogen (*i.e.*, a gas mixture that does not include oxygen) is introduced into the chamber through

another gas inlet to deposit a film comprising oxygen on the substrate. Thus, claim 28 describes a method wherein material that is deposited as part of the film on the wafer is contributed by the gas mixture that is introduced into the chamber adjacent an edge of the substrate. Applicants respectfully request allowance of claims 28 and 29.

In conclusion, the references cited by the Examiner, neither alone nor in combination, teach, show, or suggest the method or apparatus of the present invention. Having addressed all issues set out in the office action, Applicants respectfully submit that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please replace paragraph [0050] on page 16 with the following paragraph:

[0050] In step 630, process gas mixture containing an oxidizer, such as oxygen or ozone (O_3), and/or a carrier gas, such as argon or helium, and a carbon silicon gas source, such as those listed above or a combination thereof, is supplied adjacent an edge of the substrate through purge gas inlet 510 of susceptor 12 at a flow rate of about 1 sccm to about 150 sccm, preferably about 100 sccm. In one aspect, it is contemplated that one or more carbon silicon gas sources may be used to advantage with the invention. The carbon silicon gas sources are supplied to the chamber through the manifold 11, or showerhead, and/or a purge gas inlet in the susceptor 12. In another aspect, it is contemplated that a self-oxidizing carbon silicon gas source eliminates the need for a separate oxidizer. In yet another aspect, it is contemplated that [tetraetheyl] tetraethyl orthosilicate (TEOS) may be delivered through the purge gas inlet in the susceptor 12 to increase the concentration of silicon oxide at the edge of the substrate.

IN THE CLAIMS:

Please cancel claims 16-22 without prejudice and amend the claims as follows:

1. (Amended) A method for depositing a film on a substrate, comprising:

positioning a substrate in a chamber on a substrate support;

flowing a carrier gas into the chamber;

flowing a process gas mixture adjacent an edge of the substrate through a purge gas inlet in the substrate support;

generating a plasma;

delivering a first carbon silicon gas source to the chamber through another gas inlet; and

depositing [a film] on the substrate a film that has a different composition at the edge of the substrate than at the center of the substrate.

6. (Amended) The method of claim 5, wherein the carrier [gases] gas in the process mixture delivered to the edge of the substrate [are] is selected from the group consisting of argon, helium, and combinations thereof.

8. (Amended) The method of claim 3, wherein the process gas mixture delivered to the edge of the substrate further comprises [tetraetheyl] tetraethyl orthosilicate (TEOS).

10. (Amended) The method of claim 7, wherein the substrate is maintained at a temperature of about [300ºC] 300°C to about [400ºC] 400°C.